

CLAIMS

What is claimed is:

1. A compressible pressure conduction composite comprising:

(a) a porous, nonconductive matrix; and

5 (b) a conductive filler dispersed within said nonconductive matrix, said conductive filler providing an electrical path when said nonconductive matrix is compressed.

2. A compressible pressure conduction composite comprising:

(a) a porous, nonconductive matrix; and

10 (b) a conductive filler dispersed within said nonconductive matrix, said conductive filler providing an electrical path when said nonconductive matrix is compressed; and

(c) an additive disposed within said porous, nonconductive matrix, said additive improving switch function.

15 3. A method for impregnating a pressure conduction composite with an additive comprising the step of suffusing said pressure conduction composite within a bath of said additive.

4. A current control device comprising:

(a) two electrodes; and

20 (b) a pressure conduction composite disposed between said electrodes, said electrodes communicating a compressive load applied onto said electrodes into said pressure conduction composite.

5. The current control device of claim 4, wherein said pressure conduction composite is porous.

6. The current control device of claim 5, wherein said porous pressure conduction composite is filled with a temperature sensitive material capable of exerting a temperature dependent force.

5

7. The current control device of claim 4, wherein said pressure conduction composite and said electrodes are porous.

8. A current control device comprising:

(a) a pressure plate electrically nonconductive and movable;

10

(b) a plate electrically nonconductive and immovable; and

(c) a pressure conduction composite disposed between said pressure plate and said plate, said pressure plate communicating a compressive load applied onto said pressure plate into said pressure conductive composite.

9. The current control device of claim 8, wherein said pressure plate, said plate, and said pressure conduction composite are porous.

15

10. The current control device of claim 8, furthering comprising two electrodes separately disposed, said pressure conduction composite contacting said electrodes and providing an electrical path between said electrodes when compressed.

11. A current control device comprising:

20

(a) at least two pressure plates electrically nonconductive and movable;

(b) a pressure conduction composite disposed between said pressure plates, said pressure plates communicating a compressive load applied onto said pressure plates

into said pressure conductive composite.

12. The current control device of claim 11, wherein said pressure plates and said pressure conduction composite are porous.

5 13. The current control device of claim 11, furthering comprising two electrodes separately disposed, said pressure conduction composite contacting said electrodes and providing an electrical path between said electrodes when compressed.

14. A current control device comprising:

(a) four pressure switches, each said pressure switch comprised of a pressure conduction composite disposed between two conductive pressure plates;

10 (b) two electrodes, each said electrode aligned in series between two said pressure switches, said pressure switches electrically connected whereby said electrodes are electrically connected parallel;

(c) two nonconductive pressure plates, said nonconductive pressure plates communicating a compressive load into said pressure switches; and

15 (d) a restoration element disposed between said electrodes and electrically isolated from said electrodes, said restoration element decompressing said pressure switches when said compressive load is removed.

16. The current control device of claim 14, further comprising at least two said devices electrically connected parallel.

20 17. The current control device of claim 15, further comprising a current measuring device electrically connected to said current control device.

18. The current control device as in one of claims 4-15, further comprising at least one

actuator comprised of a piezoelectric material, said actuator applies said compressive load.

18. The current control device as in one of claims 4-15, further comprising at least one actuator comprised of a piezoceramic material, said actuator applies said compressive load.

5 19. The current control device as in one of claims 4-15, further comprising at least one actuator comprised of an electrostrictive material, said actuator applies said compressive load.

20. The current control device as in one of claims 4-15, further comprising at least one actuator comprised of an magnetostrictive material, said actuator applies said compressive load.

10 21. The current control device as in one of claims 4-15, further comprising at least one actuator comprised of a shape memory alloy, said actuator applies said compressive load.

22. The current control device as in one of claims 4-15, further comprising at least one piezo-controlled pneumatic actuator, said actuator applies said compressive load.

15 23. A current control device comprising:

- (a) two electrodes;
- (b) an electrically nonconductive isolator;
- (c) at least one pressure plate electrically nonconductive and movable;
- (d) at least one actuator, said actuator fixed at one end and attached at a second end to said pressure plate; and
- (e) a pressure conduction composite, said pressure conduction composite and said isolator disposed between said electrodes, said pressure conduction composite

contacting said electrodes, said isolator, and said at least one pressure plate.

24. A current control device comprising:

- (a) two electrodes;
- (b) an electrically nonconductive isolator;
- 5 (c) at least one pressure plate electrically nonconductive and movable;
- (d) at least one actuator, each said actuator attached at a first end to said pressure plate;
- (e) a band whereon is fixed said at least one actuator at a second end and slidable attached to said isolator, said band restricting movement of said actuator at said 10 second end, said band communicating a mechanical load to said isolator when said actuator is extended; and
- (f) a pressure conduction composite, said pressure conduction composite and said isolator disposed between said electrodes, said pressure conduction composite contacting said electrodes, said isolator, and said at least one pressure plate.

15 25. The current control device as in claim 23 or 24, wherein said pressure conduction composite is porous.

25. The current control device as in claim 23 or 24, wherein said actuator is comprised of a piezoelectric material.

27. The circuit protect device as in claim 23 or 24, wherein said actuator is comprised of a 20 piezoceramic material.

28. The circuit protect device as in claim 23 or 24, wherein said actuator is comprised of an electrostrictive material.

29. The current control device as in claim 23 or 24, wherein said actuator is comprised of
a magnetostrictive material.

30. The current control device as in claim 23 or 24, wherein said actuator is comprised of
a shape memory alloy.

5 31. The current control device as in claim 23 or 24, wherein said actuator is a piezo-
controlled pneumatic device.

10

15

20